United States
Environmental Protection Agency

Office of Transportation and Air Quality
National Vehicle and Fuel Emissions Laboratory
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Data Processing and Data Transfer Procedure

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NVFEL Reference Number

020

Implementation Approval

Original Procedure Authorized by EPCN # 253 on 03-21-2002

Revision Description

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Table of Contents

1. Purpose

The purpose of this working procedure is to describe the equipment and steps required to process emissions and high frequency data in Engine Test Cell #9

2. Test Procedure

100 Prepare the Data. The procedure is performed in Control Room 5 using the processing computer.

101 Use the (Start) button to open the menu and select "Programs/Windows NT Explorer."

102 Click on "PNGV CAS." See Arrow 1 in Figure 1. If a "PNGV CAS." folder does not exist, create one on the "Micron (C:) drive.

103 In the "PNGV CAS" folder, create a new folder (see Arrow 2 in Figure 1) with the following naming convention:

XYYYYYYYYYY.cas.ZZZ

Where: X is the first letter of the MTS test number being processed,
YYYYYYYYYY is the numeric portion of the test number being processed,
ZZZ is the CAS Mode number of the test being processed.

For each CAS Mode to be processed, a new folder must be created.

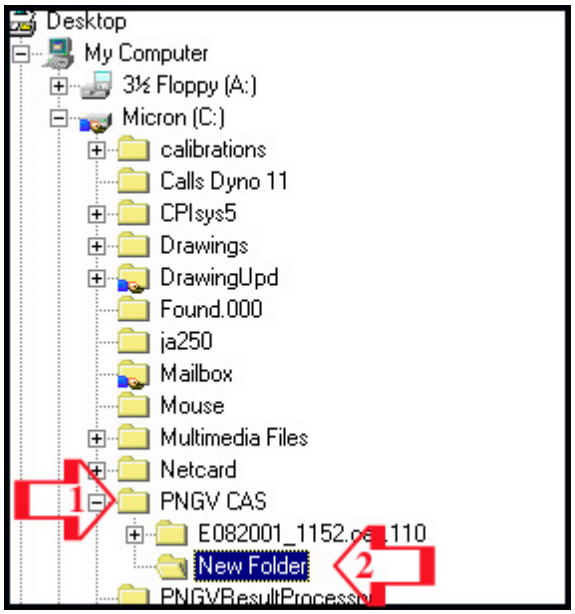


Figure 1
PNGV CAS

104 Click on “Holdforreview on ‘Cell09’(N:).” See the arrow in Figure 2. From the right pane, “Contents of ‘N:” Click on the data folder for the MTS low frequency test number to be processed and move its contents to the folder created in Step 103.

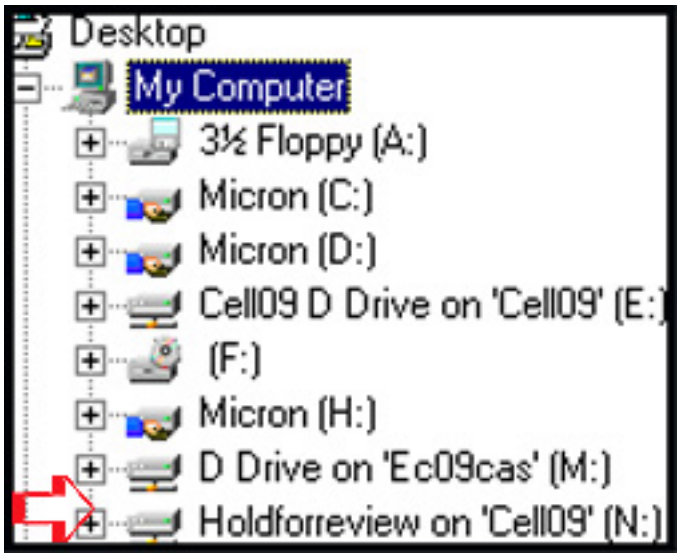


Figure 2
Holdforreview on ‘Cell09’

105 Click on the “D Drive on ‘Ec09cas’(M:)” folder.. See Arrow 1 in Figure 3. From the resulting folders, click on the “testdata” folder. See Arrow 2 in Figure 3.

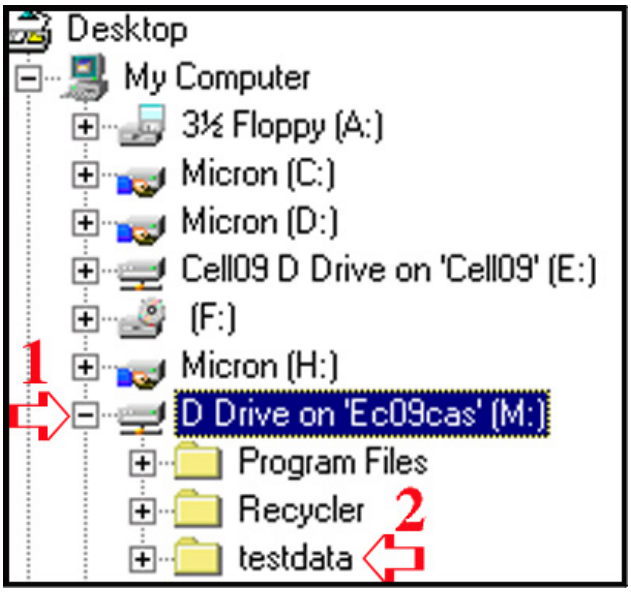


Figure 3
D Drive on ‘Ec09cas’(M)/testdata

106 From the right pane, “Contents of ‘M:\” click on the data folder for the for the high frequency test number to be processed and send its contents to the applicable folder created in Step 103.

107 Minimize the “Exploring N:\” screen.

200 Process the Data

201 From the Desktop, double-click on the “PNGV Test Result Processor” icon. See Figure 4.

Figure 4
PNGV Test Result Processor

202 In the “Login” dialog box, enter the user name and password. Click on “OK.”

203 On the "PNGV Test Result Processor" screen (See Figure 5), use the keyboard to enter, or click on the pull-down menu arrow to select the appropriate data for each field described in Steps 204 through 230.

In fields with a pull-down menu, if the desired data is not present, use the keyboard to enter it. Click on the <+> button to save the item as a future menu selection, if desired. If an item is to be deleted from the pull-down menu, select it, then click on the <-> button.

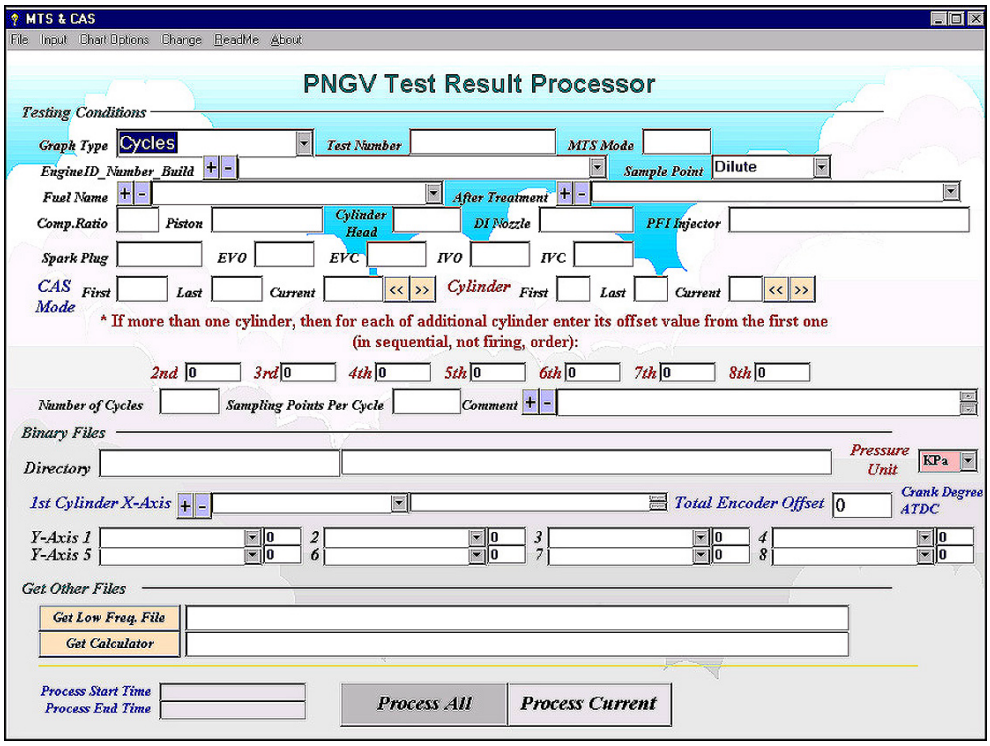


Figure 5
PNGV Test Result Processor

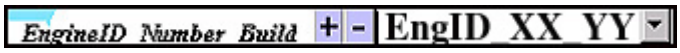
204 Use the keyboard to enter the "Test Number," where: X is the first letter of the MTS test number being processed and YYYYYYYYY is the numeric portion of the test number being processed. See Figure 6.

Figure 6
Test Number

205 Use the keyboard to enter the "MTS Mode" number, which should correspond to the "CAS Mode", number (the last three numbers of the folder named in Step 103). See Figure 7.

Figure 7
MTS Mode

206 Use the pull-down menu to select, or the keyboard to enter, the appropriate "EngineID_Number_Build." See Figure 8. There must be an entry for each item (Engine ID, Number and Build). If an item is not applicable, enter "0 (zero)" in its place.



Engine 8
Engine ID_Number_Build

207 Use the pull-down menu to select, or the keyboard to enter, the appropriate "Sample Point" corresponding to the location of the emissions probe on the test engine; "DILUTE" or "TAILPIPE." See Figure 9.

Figure 9
Sample Point

208 Use the pull-down menu to select, or the keyboard to enter, the appropriate "Fuel Name." See Figure 10.

Figure 10
Fuel Name

209 Use the pull-down menu to select, or the keyboard to enter, the appropriate "After Treatment" or select "None." See Figure 11.

Figure 11
After Treatment

210 Use the keyboard to enter the compression ratio, “Comp.Ratio” of the test engine. See Figure 12.

Figure 12
Comp. Ratio

211 Use the keyboard to enter the “Piston” type used in the test engine. See Figure 13.

Figure 13
Piston

212 Use the keyboard to enter the “Cylinder Head” used in the test engine. See Figure 14.

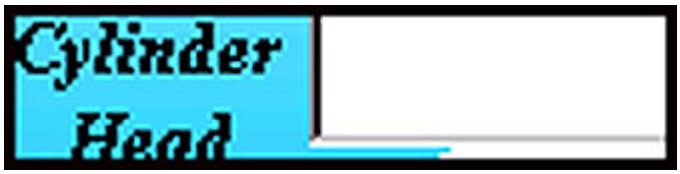


Figure 14
Cylinder Head

213 Use the keyboard to enter the “DI Nozzle.” See Figure 15.

Figure 15
DI Nozzle

214 Use the keyboard to enter the “PFI Injector.” See Figure 16.

Figure 16
PFI Injector

215 Use the keyboard to enter the “Spark Plug” number. See Figure 17.

Figure 17
Spark Plug

216 Use the keyboard to enter the “EVO” crank angle. See Figure 18.

Figure 18
EVO

217 Use the keyboard to enter the “EVC” crank angle. See Figure 19.

Figure 19
EVC

218 Use the keyboard to enter the “IVO” crank angle. See Figure 20.

Figure 20
IVO

219 Use the keyboard to enter the “IVC” crank angle. See Figure 21.

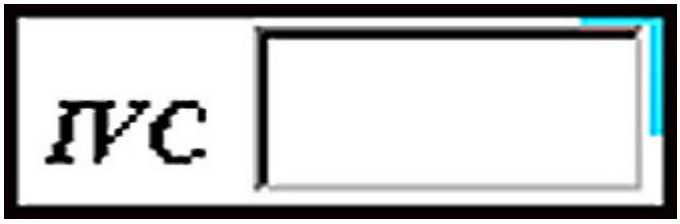


Figure 21
IVC

220 Use the keyboard to enter the number of the first “CAS Mode” to be processed in the “First” field. Enter number of the last “CAS Mode” to be processed in the “Last” field. See Figure 22. Use the directional buttons for the “Current” field to select a particular “CAS Mode” to process. For example, if only one mode is to be processed, the “First”, “Last”, and “Current” field will contain the same data.

Figure 22
CAS Mode

221 Use the keyboard to enter the number of the first “Cylinder” to be processed in the “First” field. Enter number of the last “Cylinder” to be processed in the last “Last” field. See Figure 22. Use the directional arrows for the “Current” field to select a particular “Cylinder” to process.

Figure 23
Cylinder First_Last

222 If more than one cylinder is being processed, enter the next offset value from the first (in sequential order) in the “2nd” field. For each additional cylinder enter the offset value each in sequential order. See Figure 24.

Figure 24
Cylinder 2nd through 8th

223 Use the keyboard to enter the Number of Cycles. See Figure 25. The default number is 6.

Figure 25
Number of Cycles

224 Use the keyboard to enter the Sampling Points Per Cycle. See Figure 26. The default number is 720.

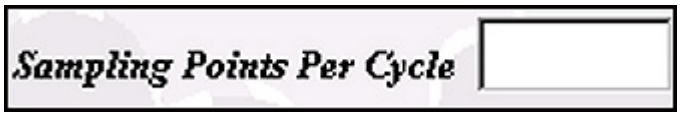


Figure 26
Sampling Points Per Cycle

225 Use the keyboard to enter Comments, if necessary. See Figure 27. For a comment to apply to the current mode and cylinder only, click-on the <+> button.

Figure 27
Comment

226 Verify that “Directory” contains the correct drive and directory designation. See Arrow 1 in Figure 28. If it is incorrect, enter the drive and directory for the folder containing the test data to be processed.

Enter the file path for the test being processed. See Arrow 2 in Figure 28.

Figure 28
Directory

This is the directory path for the CAS file that will be used to plot the X and Y-axis on the graph in the report.

227 Use the pull-down menu to select the "Pressure Unit." This is the unit of pressure used for the raw test data. See Figure 29. . The default is zero Kpa.

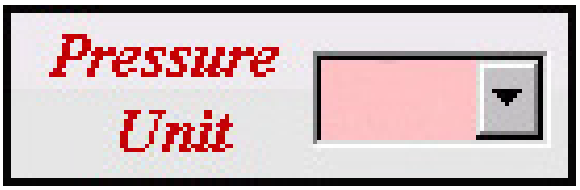


Figure 29
Pressure Unit

228 Use the pull-down menu to select the "1st Cylinder X-Axis" file name of the first cylinder to processed within each CAS mode. See Figure 30.

Figure 30
1st Cylinder X-Axis

229 Use the keyboard to enter the appropriate Total Encoder Offset. This is required if the Top-Dead-Center (TDC) crank angle is not reflected in the data point of the X-axis file for the 1st cylinder of the CAS Mode to be processed. See Figure 31.

Figure 31
Total Encoder Offset

230 Use the pull-down menu to select the appropriate Y-Axis channel name and in the adjacent field, use the keyboard to enter the offset. The Y-axis offset default is zero. See Figure 32.

Figure 31
Y-Axis

231 On the "PNGV Test Result Processor" screen, click on "Get Low Freq. File." See Figure 32. Select the low frequency (MTS) file for the test to be processed and click on "Open." The directory path will appear in the "Get Low Freq. File" field.

Figure 32
Get Low Freq. File

232 From the "PNGV Test Result Processor" screen, click on "Get Calculator." See the arrow in Figure 33. Select the file for the calculator to be used and click on "Open." The directory path will appear in the "Get Calculator" field.

Figure 33
Get Calculator

233 On the Menu Bar, click on "Chart Options." See the arrow in Figure 34.

Figure 34
Chart Options

234 Use the keyboard to enter the Chart Title. Also enter following under the X and Y Axis headings. See Figure 35. The values are obtained from data collected during the 4-cyclinder engine test and are recommendations from the assigned engineer.

Title
Maximum
Minimum
Major Unit
Minor Unit

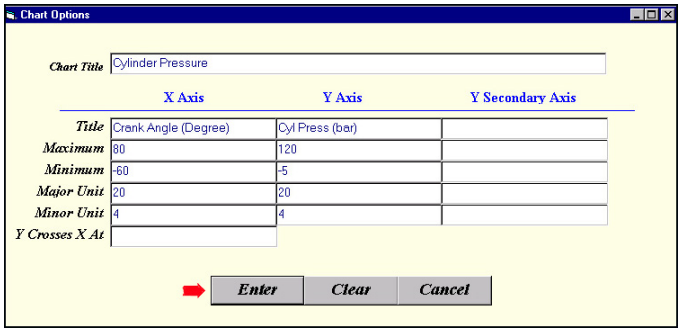


Figure 35
Chart Options

235 On the "Chart Options" dialog box, click on "Enter ." See the arrow in Figure 35.

236 On the Menu Bar, click on “Input.” See the arrow in Figure 36.

Figure 36
Input

237 From the "Input Menu" select “Save.”

238 From the “PNGV Test Result Processor” screen, click on the appropriate process button.

Click on the “Process All” button if all the CAS modes selected in the “First” and “Last” field in Step 220 and all the “Cylinders” selected in the “First” and “Last” field in Step 221 are to be processed.

239 If the “CAS mode in the “Current” field in Step 220 and the cylinder in the “Current” field in Step 221 are to be processed, click on “Process Current”. See Figure 37.

Figure 37
Process Button

Note that the “Process Start Time” will appear in the appropriate field. See Figure 38.

Figure 38
Process Start Time

240 The “PNGV Test Result Processor” will appear in print preview form. See Figure 39.

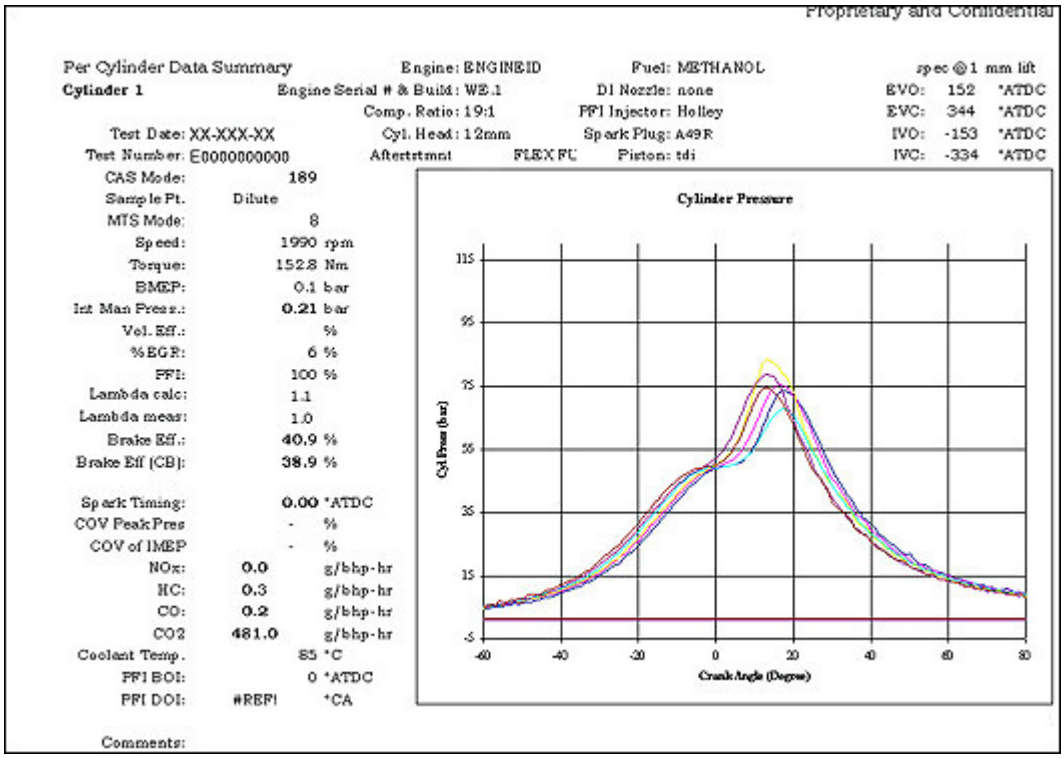


Figure 39
Test Report

241 Check the data. If an error, or incomplete data is observed, recheck the input for correctness and reprocess if necessary. If an error or incomplete data is observed after reprocessing, contact the ATD project engineer for guidance.

If the Data is correct, click on the “Close” button on the “Print Preview” menu bar. The Test Result Processor will automatically process the data, store the results in the “D:\PNGV CAS” folder, and print a report for each CAS mode and cylinder processed.

3. Acceptance Criteria

3.1 For each CAS Mode to be processed, a new folder must be created.

3.2 For the “EngineID_Number_Build” entry, there must be an entry for each item (Engine ID, Number and Build). If an item is not applicable, a “0” must be entered in its place.

3.3 If an error, or incomplete data is observed when checking the data for the print preview version of the “PNGV Test Result Processor,”, the input must be rechecked for correctness and reprocessing is necessary. If an error or incomplete data is observed after reprocessing, the ATD project engineer must be contacted for guidance.